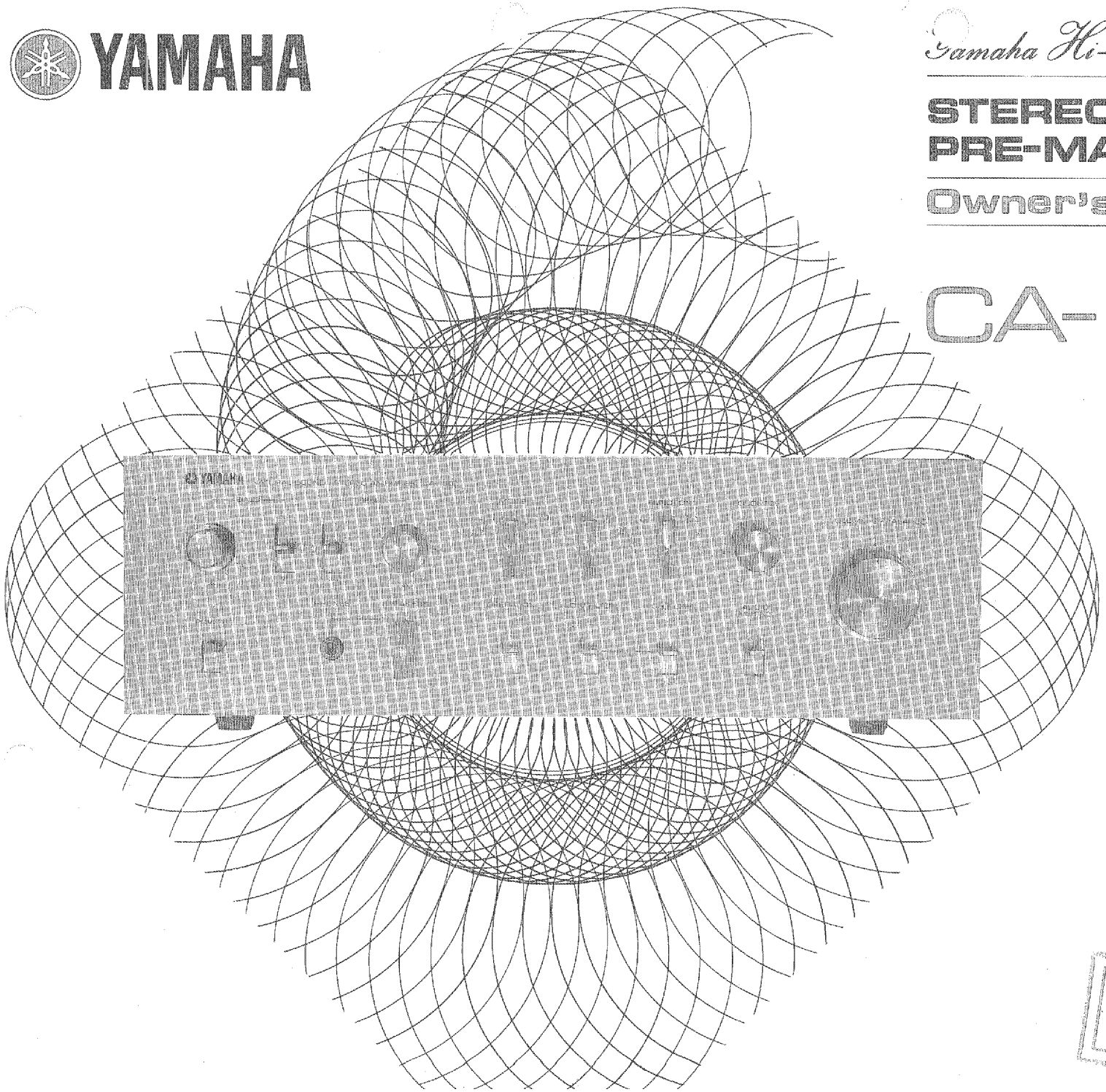
YAMAHA

Yamaha Hi-Fi Stereo

STEREO/ PRE-MAIN AMPLIFIER

Owner's Manual

CA-1000



Congratulations upon your selection of the Yamaha CA-1000, one of the world's finest stereo pre-main amplifiers.

Please read this manual carefully to avoid errors in connection, placing and operation, in order to derive all the years of outstanding listening pleasure your CA-1000 was built to provide.

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FEATURES

Input capacity 310m Vrms, RIAA deviation ±0.2dB thanks to FET type SRPP input stage and SEPP output stage. Built-in equalizer amp and headphone amp for home disc jockey use.

Ultra-low distortion pure complementary all-stage direct-coupled OCL main amp with switchover possibilities between Class A and Class B operation.

Special Yamaha tone control amp and filter amp with incredibly low distortion and convenient three-stage control.

Continuous loudness control lets you match the response to any volume level.

A pair of giant 18,000 μF capacitors assure constant voltage supply at all times.

Transistorized relay type speaker protectors and all solid-state transistor protector circuits.

Panel designed for the last word in control convenience, balanced by luxury wood cabinetry.

PRECAUTIONS

For optimum performance and service life, be sure to read this manual carefully before connecting or operating the CA-1000. Pay special attention to the following points.

- Avoid exposing the unit to direct sunlight or excessive heat.

- Due to the extreme high power of the CA-1000, its output transistors can develop a great deal of heat. While this can result in a temperature of 70°C or more the top ventilator screen, it is no cause for alarm as long as the unit has plenty of air. For this reason, be sure the body is resting on its legs (the lower ventilator screen must not be blocked), and that any unit placed on the top is also separated by legs.

- After the power is switched on, no sound will be heard from the speakers for approximately four seconds. This is due to the working of the shock noise protection circuit.
  After this period the circuit normally goes off and the speakers will sound.

- Be sure to operate all switches according to the explanations which follow in this manual. Be careful to avoid sudden surges of power or sudden shutoffs in any mode.

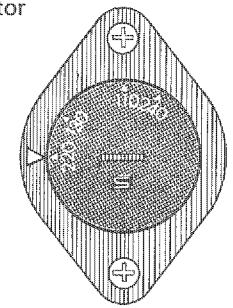
- When adjusting the volume, be sure to set the loudness to Flat position. Then, if the volume level is low enough to require this effect, turn the knob to the left until the proper setting is reached.

- When connecting or disconnecting input and output cords, make sure the volume switch is turned down all the way and that the power switch is off.

- Do not clean the exterior with thinner or other volatile products. If some thinner or insecticide does spill on the cabinet by accident, wipe it off immediately.

If your stereo has a voltage selector, before you plug in the power cord check that the selector is set to your local current.
If not properly set, turn the knob and reset it to the correct position.
Voltage settings: 110, 130, 220, 240V (the 150, 260V settings are not connected.)

Voltage Selector



SPEAKER CONNECTION

There are three sets of speaker terminals on the rear panel (A, B and C). This lets you connect three sets of stereo speakers in different parts of your home, and then switch them on and off in any combination using the front panel speaker selector. The selector has, in addition to A, B and C settings, combination possibilities: A + B and A + C.

Make sure the impedance of all connected speaker systems is 8Ω, or use just one system if it is 4Ω.

With the selector switch set to OFF no sound will be heard from any of the speakers. This is the setting for private listening via the headphones.

NOTES:

- Make sure to connect the left speaker (as seen from the listening position) to the L terminals, the right to R, in any set.
- Be especially careful not to mix the (+) and (–) leads. This can cause an out-of-phase signal and reduce stereo response (see Fig.1).
- The speaker terminals are push-lever types. As shown in Fig. 2, simply hold down the lever, insert the bare end of the lead fully into the hole and then release the lever. The wire is held by spring pressure.
- If one or both leads from a speaker are not fully connected, there will be no sound from that speaker. Be sure each lead is securely locked into the terminal.

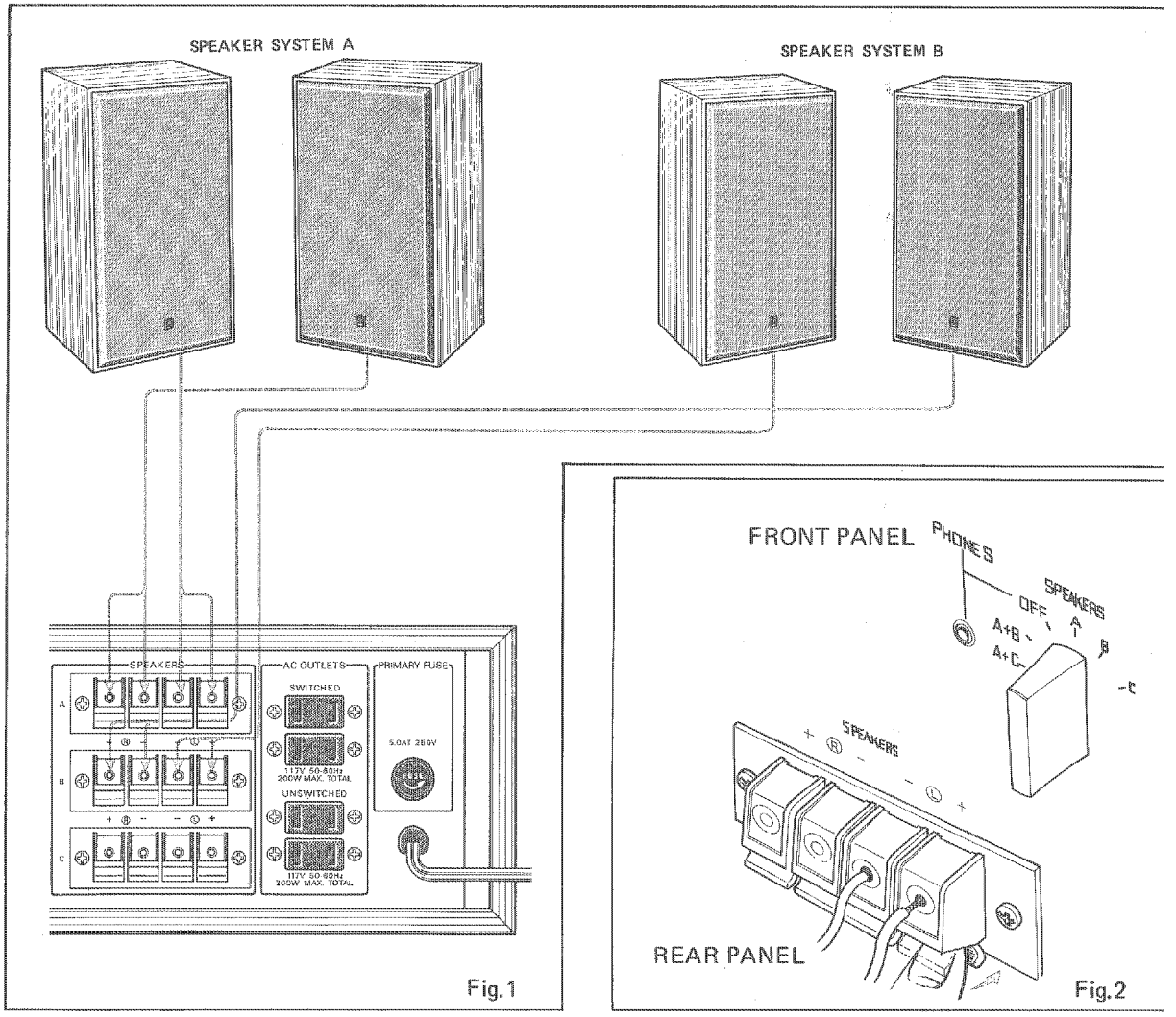


Fig.1

Fig.2

RECORD PLAYER CONNECTION AND OPERATION

There are two sets of PHONO inputs, permitting connection of two record players with moving magnet cartridges. In addition, the PHONO 1 terminals can be switched via the INPUT IMP. selector to accept signals from a record player with an MM cartridge (50kΩ or 100kΩ – see Fig.3), or an MC (moving coil) cartridge. When set to MC position the terminal automatically switches on the built-in MC amp for direct connection. At this position input sensitivity is 200μV, impedance is 100Ω.

Note: Be sure to carefully read the record player owner's manual, as well as that for the cartridge, before connecting the player to the PHONO 1 jacks. The INPUT IMP. switch on the CA-1000 is set at 50kΩ when the unit leaves the factory.

Be careful not to mix the left and right signal cords from the turntable when connecting to either PHONO 1 or PHONO 2 jacks. If there is also a ground wire from the record player, firmly connect it to the GND terminal on the CA-1000 rear panel.

Note: The set is delivered from the factory with a short pin across the PHONO 2 jacks. Remove this pin before using them.

When you listen to a record, be sure to first set the function switch on the front panel to the proper setting (PHONO 1 or PHONO 2). Then the record sound can be heard from the speakers or headphone, according to that selector setting.

If your turntable has a crystal or ceramic cartridge, do not use the PHONO jacks. Instead, connect the record player to one of the AUX jack sets.

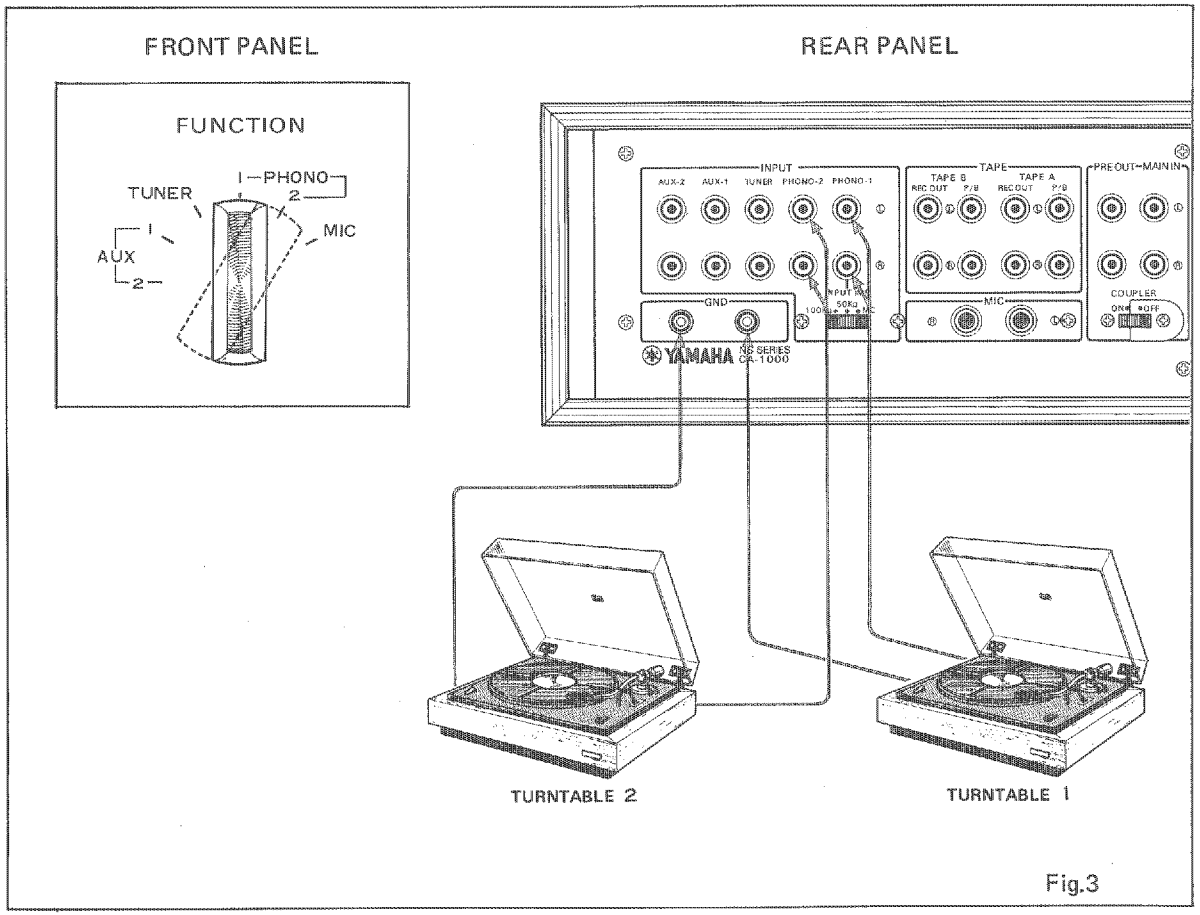


Fig.3

TAPE DECK CONNECTION AND OPERATION

There are two sets of REC OUT and PB jacks, permitting you to connect and use two tape decks at once. This lets you record on both decks at once, as well as dubbing from one deck to the other.

Connect the rear panel TAPE A REC OUT jacks and the tape deck's LINE IN jacks. Then connect the deck's LINE OUT jacks to the CA-1000 rear panel TAPE A P/B jacks. In both cases be careful not to mix left and right jacks.

If a second deck is used, connect to the TAPE B jacks in the same way. See Fig. 4.

TAPE PLAY

Set the tape switch to PLAY A or PLAY B, depending upon which set of jacks the tape signal you wish to hear is being fed in from. Then the recorded signal will be heard.

RECORDING

Set the tape switch to SOURCE and the signal being heard will also be fed to the TAPE A and B REC OUT jacks for recording. If either or both of these decks are set for recording, the signal will be recorded on the tape. In this way you can record on only one deck, either deck if you have two, or both.

If your deck is a three-head type (separate recording and playback heads), the just-recorded signal can be monitored by setting the tape switch for play (PLAY A or PLAY B, depending on which deck). As long as the deck's controls are left as they are, and the function switch is not touched, the recording will continue while you hear what has been recorded a split-second earlier.

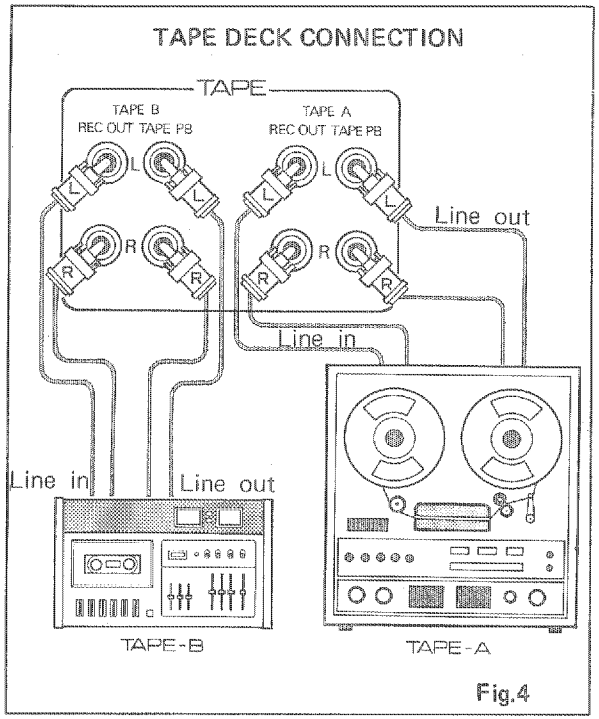


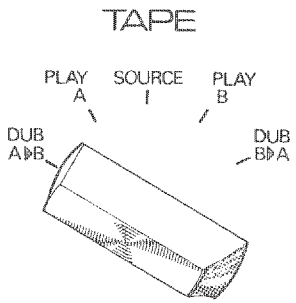
Fig.4

TAPE DUBBING

When two decks are connected it is possible to record from one to the other via the CA-1000. To record from the deck connected to the B jacks to the deck connected to the A jacks, set the first for play, the second for recording. Then set the tape switch to DUB B ▶ A and the signal will pass from the B deck to the A deck. To record in the opposite direction reverse the deck settings and set the tape switch to DUB A ▶ B. See Fig. 4.5.

Note: The function switch setting has no effect here. It does not operate unless the tape switch is set to SOURCE.

Dubbing possible between decks connected to Tape A and Tape B terminals.



Dubbing can be done in either direction.

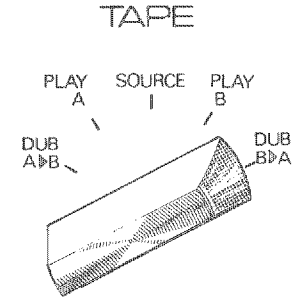


Fig.5

TUNER CONNECTION AND OPERATION

Connect the tuner L and R output cords to the proper jacks on the rear panel (the upper jack is left, the lower right).

When you want to listen to an AM or FM broadcast via the tuner, set the Function switch to TUNER. Tune in the station with the tuning knob on the tuner, then adjust the volume, etc., with the CA-1000 controls. See Figs. 6, 8.

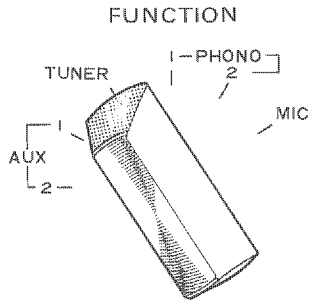


Fig.6

AUX 1, 2 CONNECTION AND OPERATION

Both these sets of auxiliary input jacks feature 120mV sensitivity and 40kΩ impedance. Their flat frequency response does away with the need for equalization for any input signal. Use these jacks to connect an 8-track cartridge deck, to test another tuner, for mike mixing, etc. Switch to the signal coming in via either of these sets of jacks with the front panel mode switch. See Figs. 7, 8.

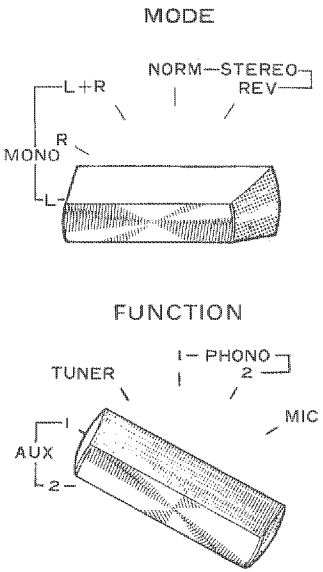


Fig.7

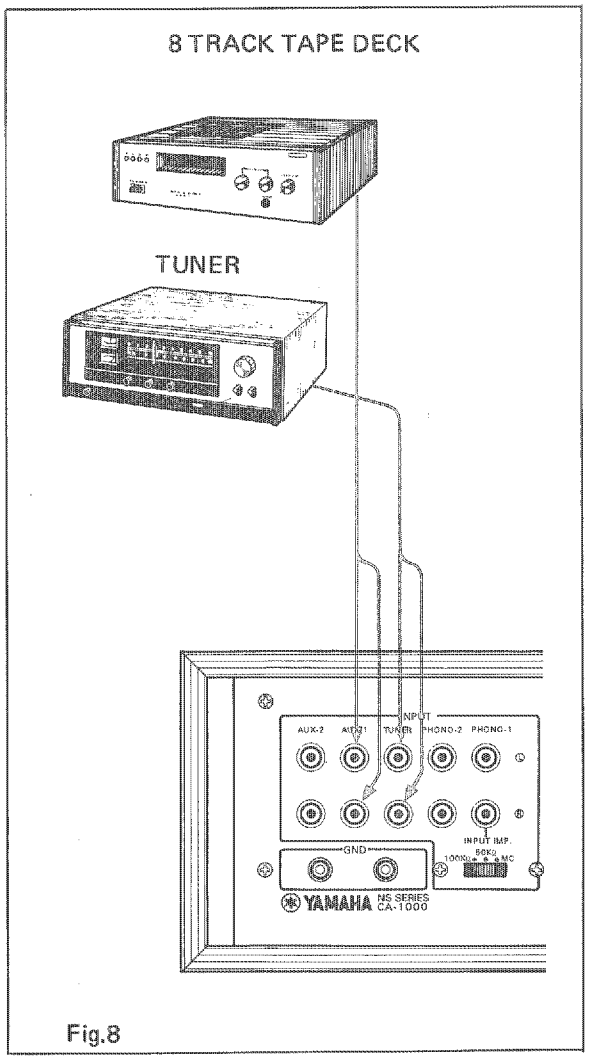


Fig.8

HEADPHONE CONNECTION

For private listening, such as late at night when you do not want to disturb others, plug a pair of stereo headphones into the jack as shown in Fig. 9. Be sure the plug is fully inserted into the jack. Then set the speaker selector switch to OFF. Now you can turn the volume up as loud as you like without any sound coming from the speakers.

There are of course left and right sides to the headphones, so examine them carefully before use.

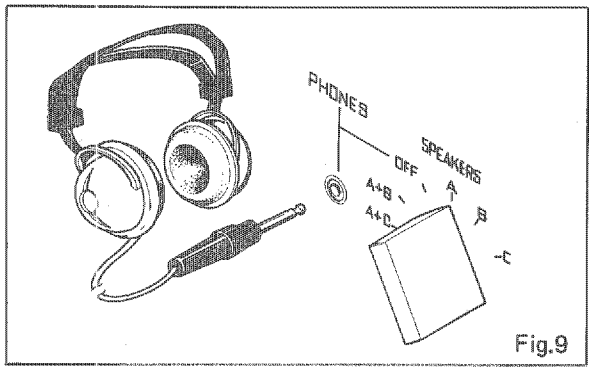


Fig.9

MICROPHONE CONNECTION AND OPERATION

To use a microphone, first plug its cord into the mike jack on the rear panel. Then set the function switch to MIC to speak through the microphone. If the volume is set too high at this time (especially if you are in front of one or more speakers) howling can occur. If only one microphone is used, set the MODE switch to MONO for that channel (see Fig.10).

Use a microphone with an impedance between 200Ω and 50kΩ. See Fig.11.

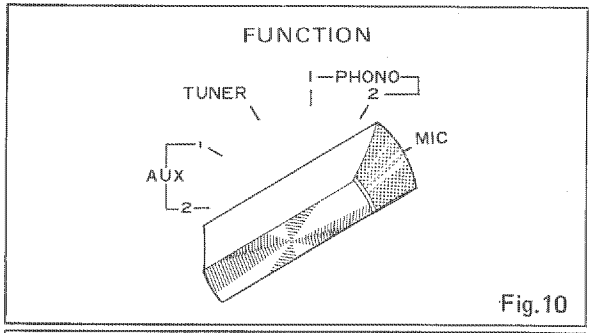


Fig.10

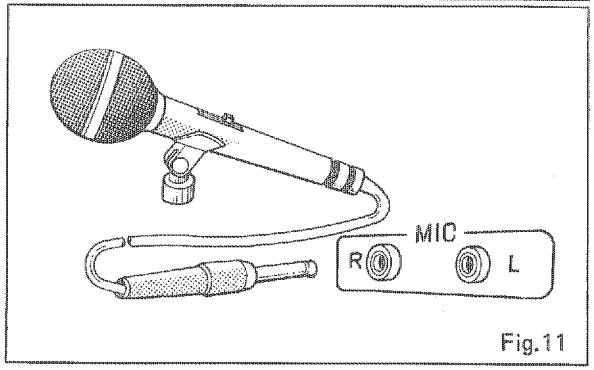


Fig.11

PRE OUT, MAIN IN CONNECTION AND OPERATION

On the rear panel are PRE OUT and MAIN IN jacks, as well as a COUPLER switch which can be set so that the pre-amp and main amp sections of the CA-1000 can be used separately. To use the set in the normal situation, with the signal passing directly from the pre-amp to the main amp, set the COUPLER switch ON. Then these jacks will be bypassed. If the switch is set OFF the pre-amp signal is not fed to the main amplifier directting it must be fed via the MAIN IN jacks.

From there it can be fed to a multi-amp system channel divider or four-channel quadrilizer amp, etc., before being passed back in whole or in part through the CA-1000 main amp.

These jacks can also be used for comparative tests or recording via a separate control amp.

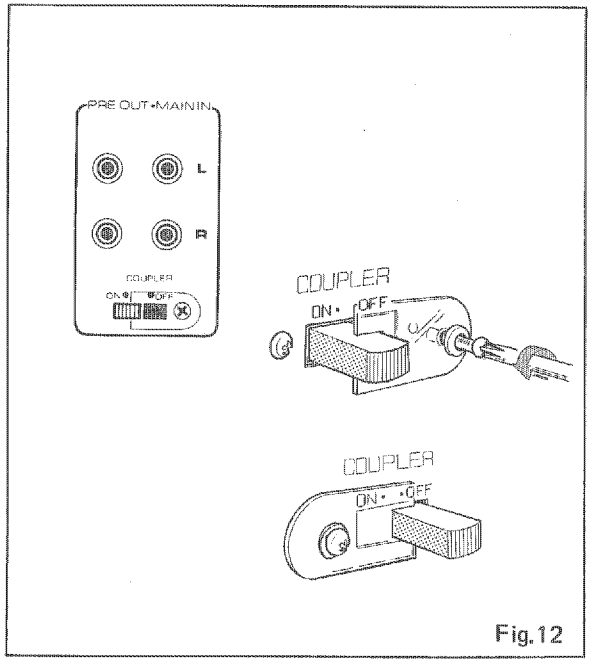
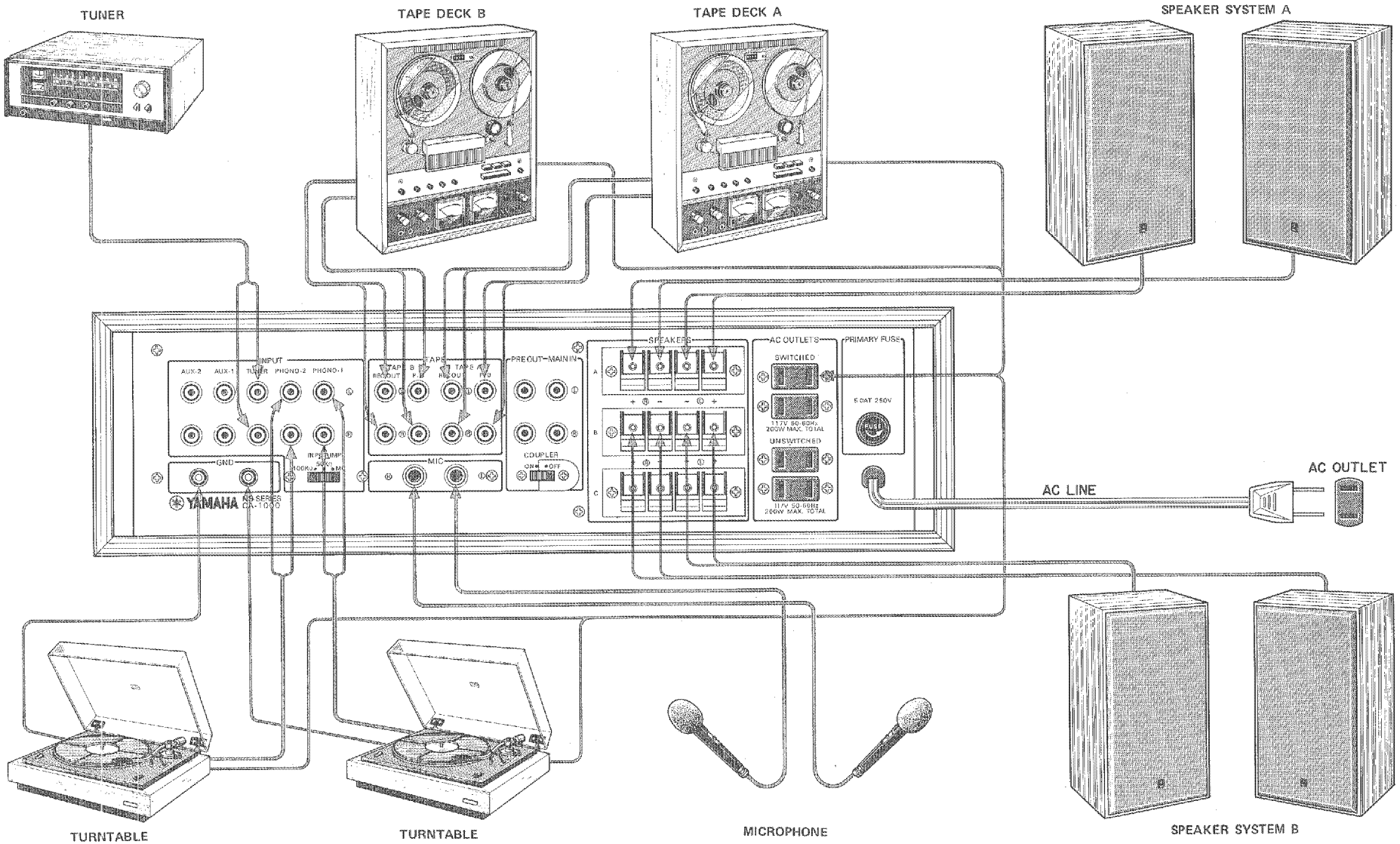
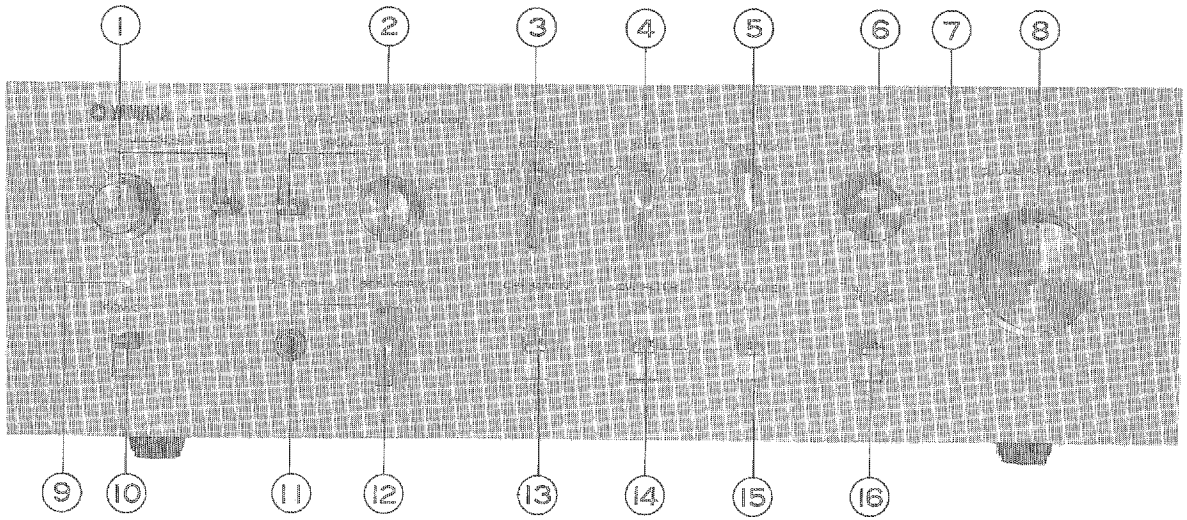


Fig.12

CONNECTION DIAGRAM



FRONT PANEL PARTS AND FUNCTIONS



⑪ **BASS** (Bass Tone Control, Bass turnover and Defeat switch)
This is both a bass tone control and a curve control switch that switches between 250Hz and 500Hz. With the switch at its center position the tone control amp becomes a flat amp. The outer portion of the knob is for the right channel, the inner portion for the left. See p.20 for details on tone controls.

⑫ **TREBLE** (Treble Tone Control, Treble turnover and Defeat switch)
This both a treble tone control and a curve control switch that switches between 2.5kHz and 5kHz. With the switch at its center position the tone control amp becomes a flat amp. The outer portion of the knob is for the right channel, the inner portion for the left. See p.20 for details on tone controls.

⑬ MODE Switch
This switch is used to select the program source. See p.19 for details on Mode switch operation.

⑭ TAPE Switch
This switch lets you monitor the sound from the tape deck(s) connected to the TAPE PB and REC OUT jacks on the rear panel. If two decks are connected, use this switch to dub from one to the other. See p.8 for details on tape deck connection.

⑮ **FUNCTION** Switch
Use this switch to select between program sources from other units connected to the rear panel jacks.
AUX 1 &
AUX 2: See p. 9 for details on AUX connections and operation.
TUNER: See p. 9 for tuner connection and operation details.

PHONO 1
& 2: See p. 7 for record player connection and operation details.
MIC: See p. 10 for microphone connection and use.

⑥ **LOUDNESS** Control
This knob provides continuous loudness control. See p.18 for loudness control details.

⑦ **BALANCE** Control
Controls the relative volume from the left and right speakers. Turning to the right makes the left channel speaker sound weaker, turning to the left does the same to the right speaker. At the center position (the dot) both speakers are evenly balanced.
Match the balance control to your room acoustics by first setting for a monaural signal, then adjusting so that the sound seems to originate from a point midway between the speakers.

⑧ **VOLUME** Control
Controls the overall volume. Turn to the right to increase volume.

⑨ **Power Lamp**
Tells you when the unit is plugged in and switched on.

⑩ **POWER** Switch
Powers the amplifier when switched on.

⑪ **PHONES** Jack
Connect a stereo headphone set here.
See p.10 for details on headphone use.

⑫ **SPEAKERS** (Speaker Selector Switch)
This switch lets you power any of the up to three speaker sets connected to the rear panel terminals. See p.6 for speaker connection and selection details.

⑬ **OPERATION** Switch
Use this switch to select Normal (class B) or low-power (class A) amplifier output.
See p.19 for details.

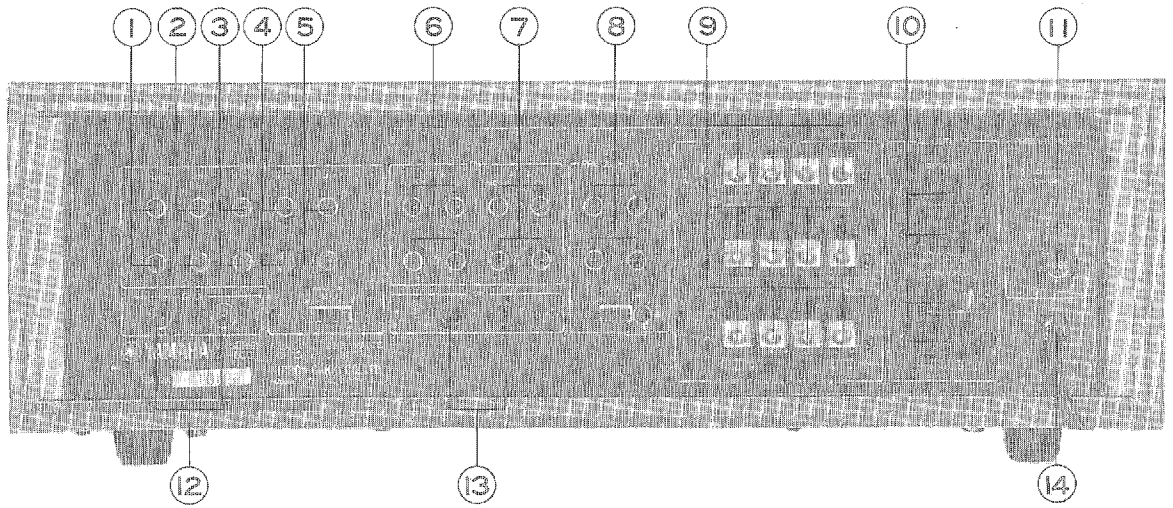
⑭ **LOW** Filter
This filter cuts low frequency tones to remove noise at the bottom end of the frequency spectrum. It has two positions in addition to OFF, providing cutoff at 70Hz and 20Hz. See p.21 for details.

⑮ **HIGH** Filter
This filter cuts high frequency tones to remove noise at the top end of the frequency spectrum. It has two positions in addition to OFF, providing cutoff at 6kHz and 12kHz. See p.21 for details.

⑯ **AUDIO MUTING** Switch
With this switch set at its −20dB position the amplifier gain (i.e., the total volume) is reduced by 20dB (to 1/10) with no need to adjust the VOLUME control. See p.18 for details.

REAR PANEL PARTS AND FUNCTIONS

• TYPE A MODEL



① AUX 2 Jacks

② AUX 1 Jacks
See p.9 for connection and function of auxiliary inputs.

③ TUNER Jacks See p. 9 for details.

④ PHONO 2 Jacks

⑤ PHONO 1 Jacks/INPUT IMP Switch See p. 7 for details.

⑥ TAPE B See p. 8 for details.
REC OUT Jacks
TAPE PB Jacks

⑦ TAPE A See p. 8 for details.
REC OUT Jacks
TAPE PB Jacks

⑧ PRE OUT-MAIN IN See p. 10 for details.
PRE OUT Jacks
MAIN IN Jacks
COUPLER Switch

⑨ SPEAKERS A B C Terminals See p. 6 for details.

⑩ AC OUTLETS
SWITCHED: Power to this outlet depends upon the position of the POWER switch on the front panel. If that switch is off, so is this outlet. Maximum power supply: 200W.
UNSWITCHED: Independent of the front panel POWER switch.
Power is supplied to this outlet as long as the CA-1000 power cord is plugged in. Maximum power supply: 200W.

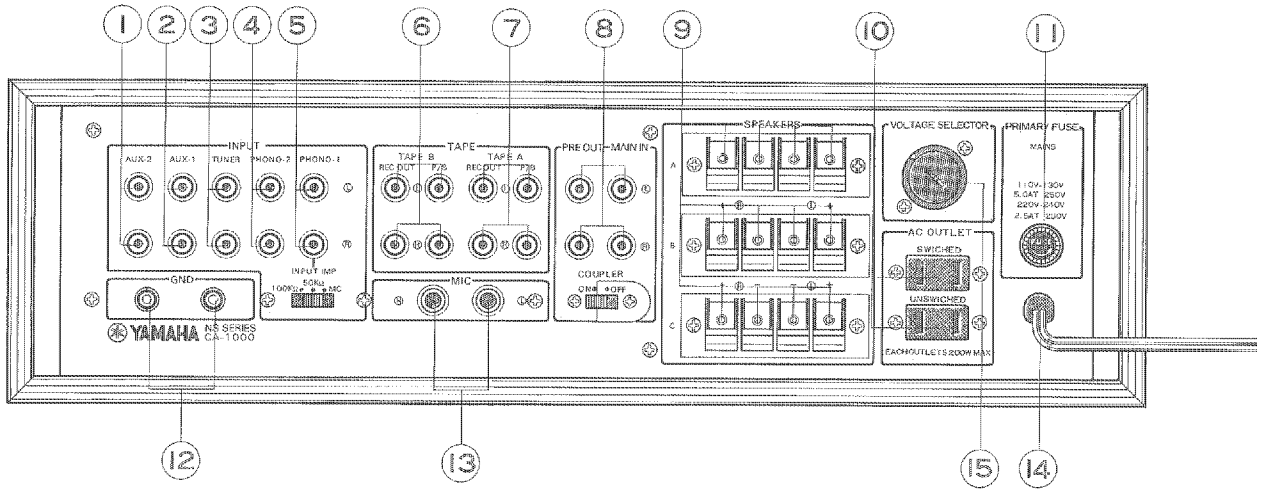
⑪ PRIMARY FUSE
Protects the amplifier circuitry. When replacing, be sure to use a fuse of the same rating.

⑫ GND (Ground) Terminal

⑬ MIC (Microphone) Jack See p. 10 for details.

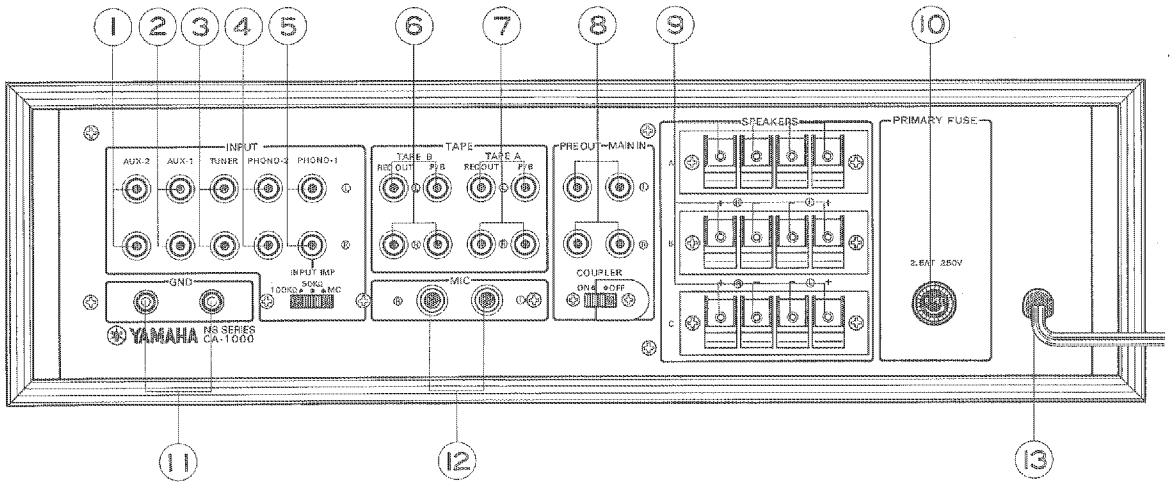
⑭ Power Supply Cord

• TYPE B MODEL



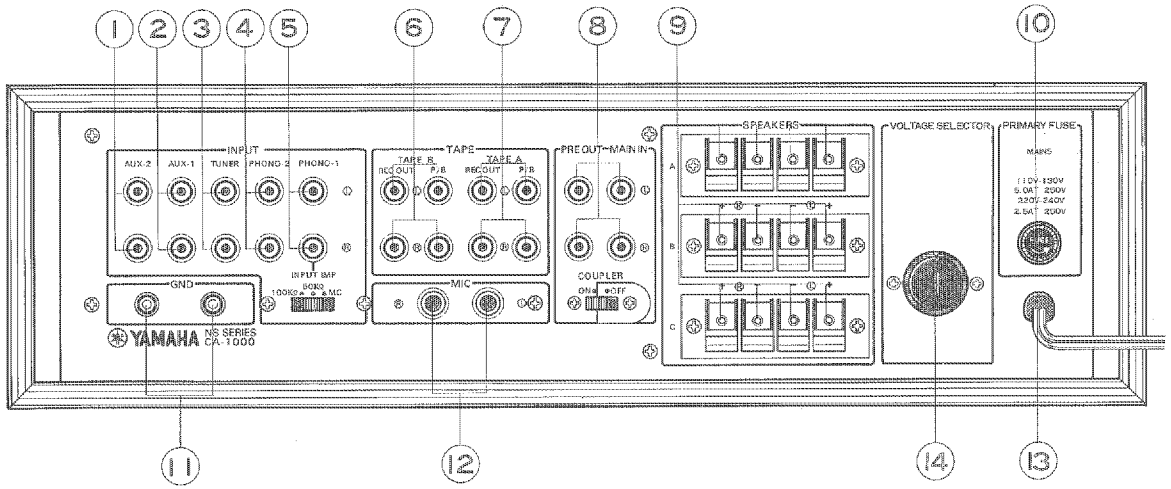
1. **AUX 2** Jacks
2. **AUX 1** Jacks
   See p. 9 for connection and function of auxiliary inputs.
3. **TUNER** Jacks See p. 9 for details.
4. **PHONO 2** Jacks
5. **PHONO 1** Jacks/INPUT IMP Switch See p. 7 for details.
6. **TAPE B** See p. 8 for details.
   REC OUT Jacks
   TAPE PB Jacks
7. **TAPE A** See p. 8 for details.
   REC OUT Jacks
   TAPE PB Jacks
8. **PRE OUT-MAIN IN** See p. 10 for details.
   PRE OUT Jacks
   MAIN IN Jacks
   COUPLER Switch
9. **SPEAKERS A B C** Terminals See p. 6 for details.
10. **AC OUTLETS**
    SWITCHED: Power to this outlet depends upon the position of the POWER switch on the front panel. If that switch is off, so is this outlet. Maximum power supply: 200W.
    UNSWITCHED: Independent of the front panel POWER switch.
    Power is supplied to this outlet as long as the CA-1000 power cord is plugged in. Maximum power supply: 200W.
11. **PRIMARY FUSE**
    Protects the amplifier circuitry. When replacing, be sure to use a fuse of the same rating.
12. **GND** (Ground) Terminal
13. **MIC** (Microphone) Jack See p. 10 for details.
14. **Power Supply Cord**
15. **VOLTAGE SELECTOR**

• TYPE C MODEL



1. **AUX 2** Jacks
2. **AUX 1** Jacks
   See p. 9 for connection and function of auxiliary inputs.
3. **TUNER** Jacks See p. 9 for details.
4. **PHONO 2** Jacks
5. **PHONO 1** Jacks/INPUT IMP Switch See p. 7 for details.
6. **TAPE B** See p. 8 for details.
   REC OUT Jacks
   TAPE PB Jacks
7. **TAPE A** See p. 8 for details.
   REC OUT Jacks
   TAPE PB Jacks
8. **PRE OUT-MAIN IN** See p. 10 for details.
   PRE OUT Jacks
   MAIN IN Jacks
   COUPLER Switch
9. **SPEAKERS A B C** Terminals See p. 6 for details.
10. **PRIMARY FUSE**
    Protects the amplifier circuitry. When replacing, be sure to use a fuse of the same rating.
11. **GND** (Ground) Terminal
12. **MIC** (Microphone) Jack See p. 10 for details.
13. **Power Supply Cord**

• TYPE D,E MODELS



1. **AUX 2** Jacks
2. **AUX 1** Jacks
   See p. 9 for connection and function of auxiliary inputs.
3. **TUNER** Jacks See p. 9 for details.
4. **PHONO 2** Jacks
5. **PHONO 1** Jacks/INPUT IMP Switch See p. 7 for details.
6. **TAPE B** See p. 8 for details.
   REC OUT Jacks
   TAPE PB Jacks
7. **TAPE A** See p. 8 for details.
   REC OUT Jacks
   TAPE PB Jacks
8. **PRE OUT-MAIN IN** See p. 10 for details.
   PRE OUT Jacks
   MAIN IN Jacks
   COUPLER Switch
9. **SPEAKERS A B C** Terminals See p. 6 for details.
10. **PRIMARY FUSE**
    Protects the amplifier circuitry. When replacing, be sure to use a fuse of the same rating.
11. **GND** (Ground) Terminal
12. **MIC** (Microphone) Jack See p. 10 for details.
13. **Power Supply Cord**
14. **VOLTAGE SELECTOR**

LOUDNESS CONTROL

The ear's sensitivity to extreme high and low sounds is noticeably reduced at low volume levels. The loudness control has been included to compensate for this fact. With conventional loudness controls, once the control is switched on it works mechanically in conjunction with the volume control setting angle. But such a system does not take into consideration the varying efficiency of speaker systems, and can thus give rise to unnatural frequency response. In order to match the actual volume level and other characteristics of the speakers and room acoustics a solution was found during the CA-1000 design stages. It consists of a continuous loudness control which can be precisely adjusted for a response curve that sounds most natural according to the actual sound hear, not that passing through the output jacks.

Set the control to FLAT and it has absolutely no effect. Then raise the volume to the highest level you expect to use. Now, whenever you turn the loudness control to the left the volume will be reduced at the same time, letting you match the sound to the room acoustics and your own listening preferences. This corrective curve works within the 0dB to −12dB range for a competely natural sound at any level.

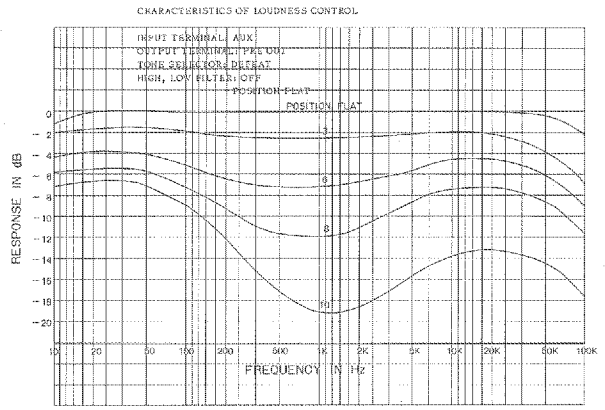


Fig.13

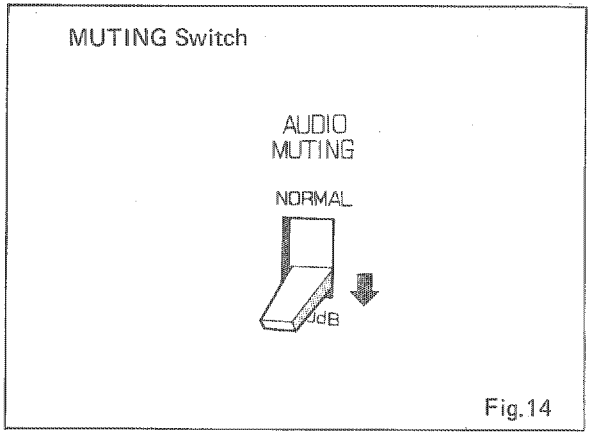


Fig.14

MUTING SWITCH

This switch permits instant reductions in volume level without touching and then later readjusting the volume control. When flicked to its −20dB position the pre-amp gain is reduced 20dB (1/10) the original level. This is ideal for temporary volume reductions, such as a telephone call in the middle of a record, etc.

If you listen at the −20dB level and then raise the volume, returning the switch to NORMAL may result in an excessive surge of power which can damage your speakers. For this reason, once the muting switch is used, be sure to return it to the NORMAL position for regular-volume listening.

MODE SWITCH

This switch is used to select the way you wish to divide or combine the various parts of the source signal selected by the function switch. When the switch is set to MONO L or MONO R, it will pick only the signal coming in through the left or right jack for that particular program, then pass that signal through both left and right output channels (speakers, headphones, PRE OUT). This setting is useful when listening to a monophonic radio, tape or TV sound signal.

When the switch is set to MONO L+R both left and right sound source signals are first mixed, then the mixed signal is fed to both output channels. This is the best position when playing a monophonic record.

For stereo signals, set to STEREO NORM. Then the left and right sound source signals are kept separated all the way through the system to the output, with each side heard through the proper speaker, etc.

The stereo signals are separated in the same way when the switch is set to REV, except that in this case the left signals are fed to the right output jacks, the right signals to the left.

MODE Switch

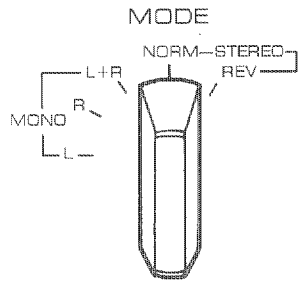


Fig.15

OPERATION SWITCH

Use this switch to assure yourself the best possible performance at all times.
Class A assures extremely low crossover distortion for the clarity at all frequencies needed for various types of serious music, such as chamber music selections.

In other words, when high output is necessary, class B mode should be used, but in low signal situations (for instance, when highly efficient speakers are used), use the class A mode to take advantage of its lower distortion, and resultant better sound quality. The mode should be selected according to the circumstances. Set the switch to NORMAL for class B mode, to CLASS A for class A mode.

During A mode operation the amplifier produces a great deal of heat, so sufficient care for ventilation should be taken, ensure that the air vents in the base any top are not covered.

OPERATION Switch

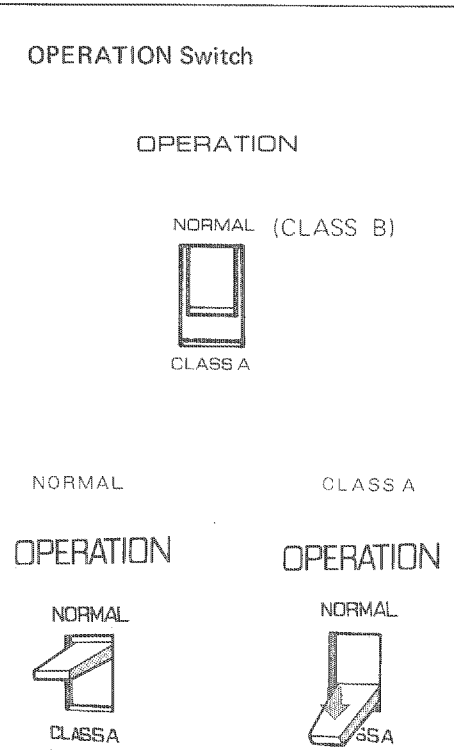


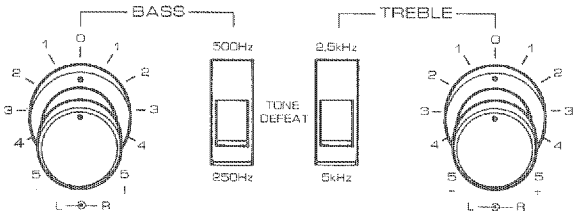
Fig.16

TONE CONTROLS

Proper tone quality differs according to the listening room and your tastes; this circuit permits you to adjust the tone settings to match your listening conditions. There are separate bass and treble controls. The bass controls are divided into 11 click stops, each approximately 3dB. The middle setting is for flat response. The knob is divided into outer portion (left channel) and inner portion (right channel).
To adjust both channels at once, first line up the dots on each part of the knob. Turn to the right to increase bass tones, to the left to decrease them. The switch to the right of this tone control is the tone defeat switch. This switch shuts off the bass tone control circuit when set to its middle position, thus providing an instant flat response without disturbing the tone control settings. The switch can also be set to 500Hz and 250Hz, depending upon how wide an effect you want the control to have (the 500Hz setting provides a wider effect).

The treble tone control works in the same way, except that in this case the human ear is more sensitive to tonal changes. For this reason each click stop has a finer (2dB) effect. The same double knob is used as for the bass control, with outer section for the left channel, the inner for the right. To the left of this knob is the treble tone defeat switch. Treble tone control can be carried out above two cutoff points set by this switch: 2.5kHz or 5kHz. The 2.5kHz section provides a wider effect.

Tone Control



Bass and Treble Turnover and Defeat Switches

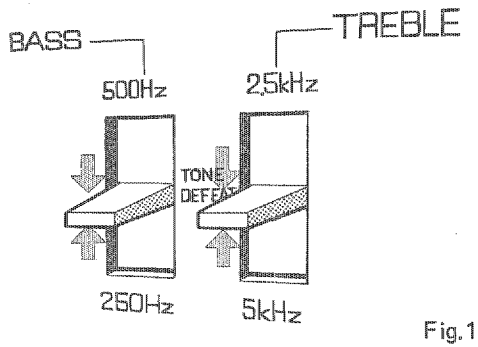


Fig.17

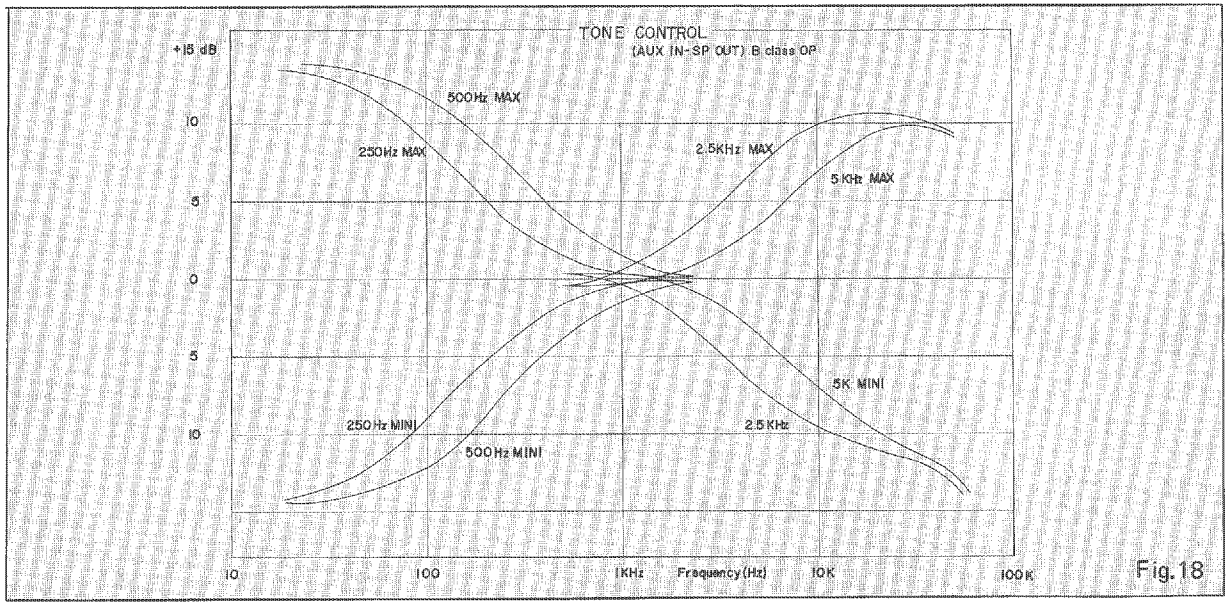


Fig.18

BALANCE ADJUSTMENT

The knob on the outside of the volume control is to adjust the left-right balance. For normal listening it should be set to the mid-point, indicated by the dot. If the sound is for some reason unbalanced, use this knob to adjust. The sound will become stronger in the direction in which the knob is turned. This control is mainly to correct balance problems originating in the sound source.

LOW & HIGH FILTERS

These filters are to eliminate noise and interference in the low and high ends of the frequency scale. Their cutoff points can also be adjusted by the front panel controls.

There are two filter positions for cutoff at 20Hz and 70Hz. The 20Hz setting is effective in canceling sub-sonic noise, such as that from a warped record, which can cause low-frequency distortion at the speaker stage. The center position of each filter is OFF. Cutoff characteristics at either on setting are 12dB/octave.

Except in unusual cases, it is best to keep the 20Hz filter on, in order to avoid vibrations from poor quality speaker cones.

There are also two high filter settings, to cancel treble noise such as that from a scratched record, etc.: 6kHz and 12kHz. Set to the 6kHz point the filter affects a greater portion of the frequency scale than the 12kHz setting. For this reason it is best to limit the setting to 12kHz if the noise level is sufficiently reduced at this point. Cutoff characteristics for both settings are 6dB/octave. The mid position is OFF, and the switch should be left here under normal listening conditions.

BALANCE Adjustment (out section)

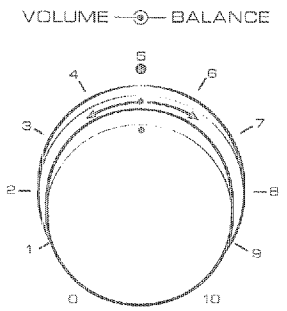
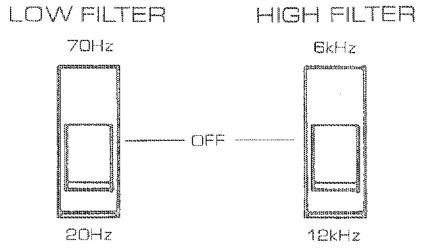


Fig.19

LOW & HIGH FILTERS



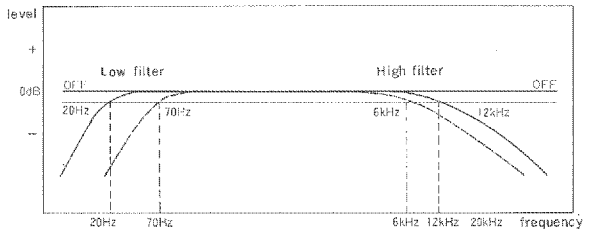


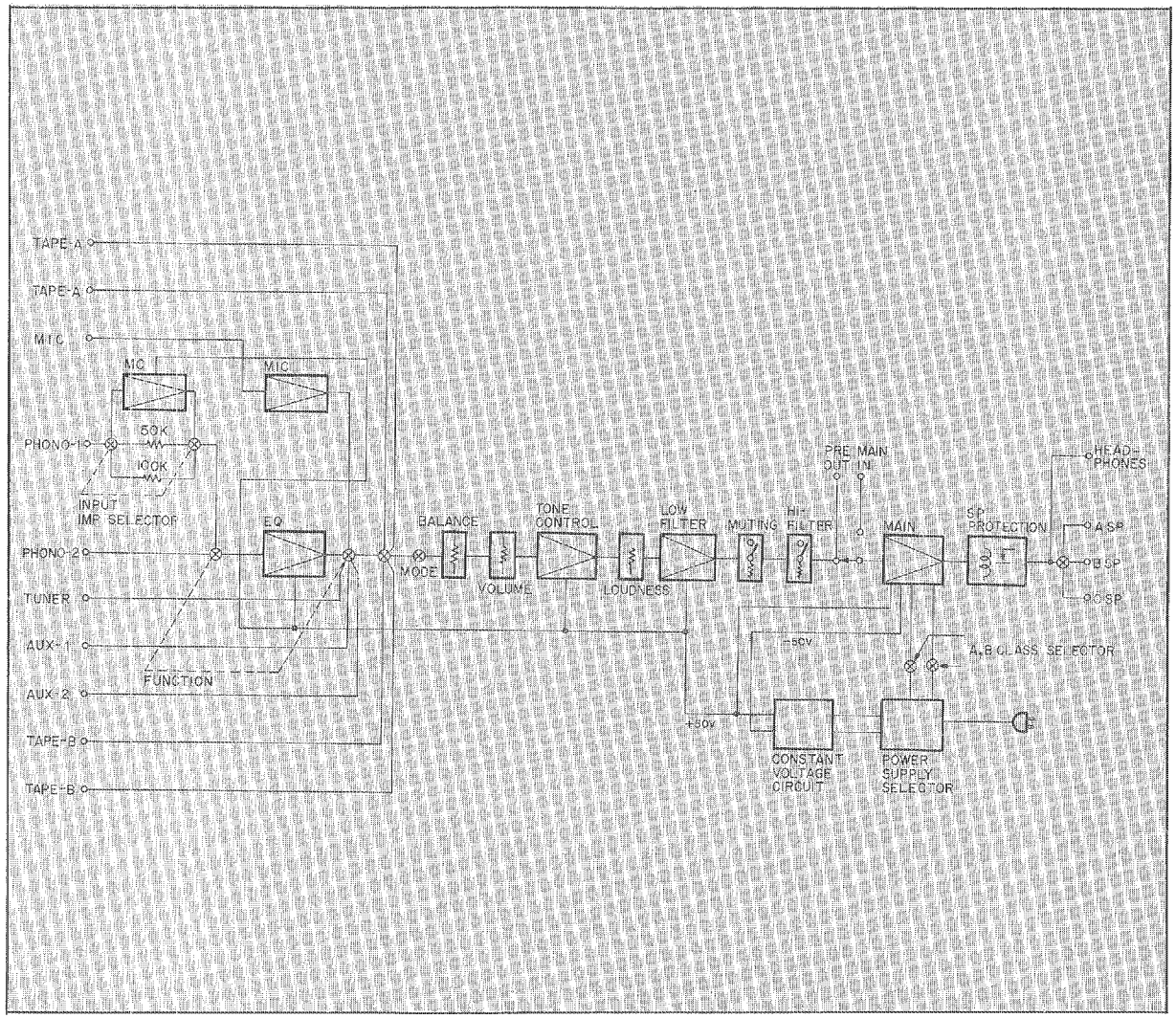
Fig.20

TROUBLESHOOTING

Trouble	Cause	Correction
No power when switch set on.	Cord not sufficiently plugged into socket.	Plug in firmly.
	Blown power fuse.	Replace.
Connections complete, but no sound regardless of Function switch setting.	The Pre Out/Main In Coupler switch is off.	Switch it on.
	Tape switch not set to Source.	Reset.
No sound from one or both speakers.	Faulty speaker cord connection.	Reconnect firmly.
	Speaker switch off.	Switch on for that speaker system.
	Balance control improperly set.	Readjust for proper setting.
Sound suddenly stops during performance.	The speaker protection circuits cut off because a potential of more than ±2V DC is generated.	When the potential returns to 0V the relay circuit will switch on again.
		Switch OFF, after a while ON.
	Power fuse blown.	Replace.

Poor bass response or audio image.	Speakers out of phase.	Recheck(+) and (−) connections of each speaker.
Insufficient volume, even with control turned up.	Audio Muting switch set to −20dB position.	First turn volume control down, then set Audio Muting switch to NORMAL.
High and low tones unnaturally loud.	Volume turned up with Loudness control left on.	When adjusting the volume, first set the loudness switch for flat response, then adjust the volume control for the loudest level you expect to use. Now the volume can be controlled with the loudness control.
		When no loudness effect is desired in a high-volume situation, turn the control to its flat response position.

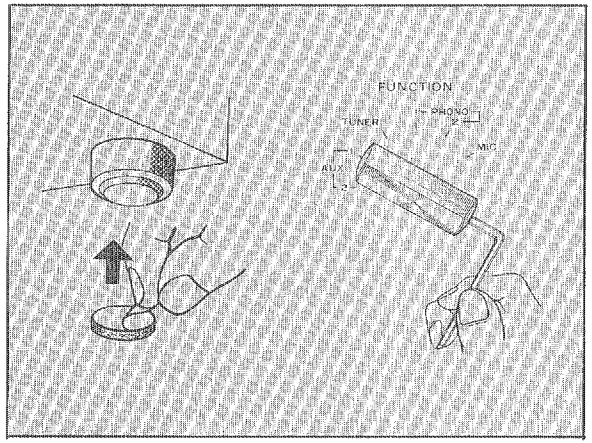
Hum or booming during record play.	Faulty pin plug-shielded cord connection.	Replace cord.
	Player not grounded.	Connect player ground lead to GND terminal on CA-1000 rear panel. Disconnect if no improvement noted.
Interference from nearby amateur radio transmitter (especially during PHONO operation).	Too close to transmitter.	Contact the amateur operator and have him take counter measures with his transmitter.
		Contact your nearest governmental regulation agency.
Sudden sound surging when volume raised during record play.	This is howling, caused by having the record player too close to the speakers, or by an unstable player location.	Rearrange the player and speakers.
Variation in volumes between FM/AM broadcasts, records and tape playback.	Output of connected tuner, player, deck, etc. differs.	Reset each time function lever switched, using volume control.



ACCESSORIES

Pads:
Use the pads when another amp, record player, etc. is placed on top of the CA-1000. They protect the upper surface from scratches. To use, remove the paper from each pad and stick it to the bottom of the other unit's foot rest.

Wrench:
This hexagonal wrench is used to adjust the function and speaker selector settings if they are not lined up with the indications.



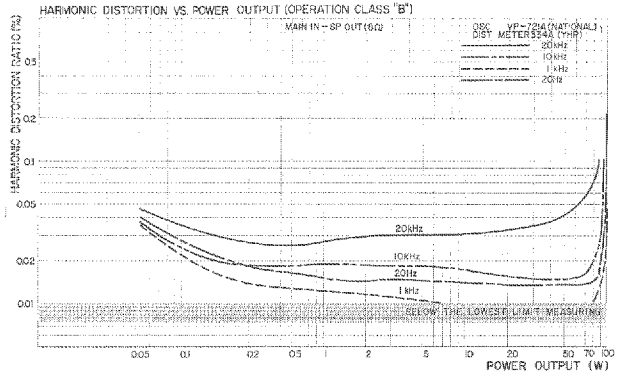
SPECIFICATIONS

AUDIO SECTION	CLASS B	CLASS A
POWER OUTPUT		
Dynamic Power (IHF)	200 watts (4Ω)	—
	200 watts (8Ω)	30 watts (8Ω)
Continuous RMS Power (each channel driven)	100/100 watts (4Ω) at 1,000Hz	—
	80/80 watts (8Ω) at 1,000Hz	15/15 watts (8Ω)
Continuous RMS Power (both channels driven)	100 + 100 watts (4Ω) at 1,000Hz	—
	75 + 75 watts (8Ω) at 1,000Hz	15 + 15 watts (8Ω)
Continuous RMS Power (both channels driven)		
	85 + 85 watts (4Ω) at 20 to 20,000Hz	—
	70 + 70 watts (8Ω) at 20 to 20,000Hz	15 + 15 watts (8Ω)
TOTAL HARMONIC DISTORTION		
Power Amplifier Only	less than 0.1% at rated power	less than 0.1% at rated power
	less than 0.04% at 1 watt	less than 0.02% at 1 watt
Preamplifier Only (PHONO to PRE OUT)	less than 0.1% at rated power	less than 0.1% at rated poer
(AUX to PRE OUT)	less than 0.02% at rated power	less than 0.02% at rated power
Overall (AUX to Power Output)	less than 0.1% at rated power	less than 0.05% at rated power
INTERMODULATION DISTORTION (70Hz:7,000Hz = 4:1 SMPTE method)		
Power Amplifier Only	less than 0.1% (8Ω) at rated power	less than 0.1% (8Ω) at rated power
Power Amplifier Only	less than 0.05% (8Ω) at 1 watt	less than 0.05% (8Ω) at 1 watt
Overall (AUX to Power Output)	less than 0.1% (8Ω) at rated output	less than 0.1% (8Ω) at rated output
POWER BANDWIDTH (IHF, distortion 0.5% const.)	5 to 50,000Hz	5 to 100,000Hz
LOAD IMPEDANCE	4 to 16Ω	(4) to 8 to 16Ω
DAMPING FACTOR (8Ω)	70 at 1,000Hz	70 at 1,000Hz
FREQUENCY RESPONSE (at 1 watt)		
Overall (Tuner, AUX, TAPE PB to Power Output)	10 to 50,000Hz + 0.5dB, −1dB	
Overall (MIC to Power Output)	20 to 20,000Hz + 0.5dB, −2dB	
Power Amplifier Only	10 to 100,000Hz + 0dB, −1dB	
Deviation from RIAA (30 to 15,000Hz)	+0.2dB, −0.2dB	
CHANNEL SEPARATION (at rated power, 1,000Hz)		
Power Amplifier Only	better than 60dB	
Overall from PHONO 1,2	better than 50dB	
Overall from Tuner, AUX, TAPE PB	better than 50dB	
Overall from MIC	better than 50dB	
HUM AND NOISE (IHF, Closed circuit A Network)		
Overall from PHONO 1,2	better than 80dB	
Overall from MIC	better than 70dB	
Overall from Tuner, AUX, TAPE PB	better than 90dB	
Power Amplifier Only	better than 100dB	
Volume at Minimum	better than 90dB	

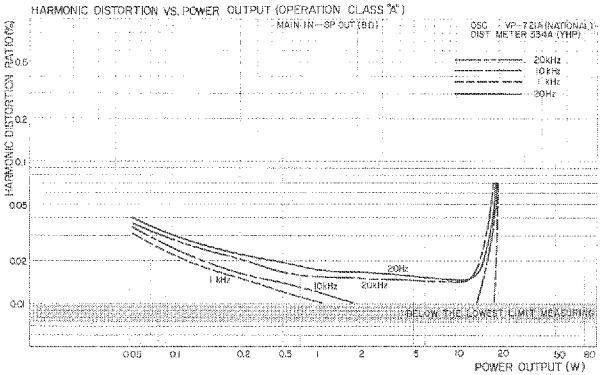
INPUT SENSITIVITY AND IMPEDANCE (at rated power, 1,000Hz)	
PHONO 1	3mV (50kΩ, 100kΩ) 200μV (100Ω)
PHONO 2	3mV (50kΩ)
PHONO 1,2 Max. Input Capability	310mV (T.H.D. 0.1%)
MIC	2.5mV (50kΩ)
MIC Max. Input Capability	200mV (T.H.D. 0.1%)
TUNER, AUX 1,2	120mV (40kΩ)
TAPE PB A,B	120mV (40kΩ)
Power Amplifier Input	775mV (40kΩ), 330mV (CLASS A)
OUTPUT LEVEL AND IMPEDANCE (at rated power, 1,000Hz)	
TAPE REC OUT A,B	120mV (2kΩ)
PRE OUT	775mV (2kΩ)
	3,000mV (Max. Output T.H.D. 0.1%)
TONE CONTROLS	
BASS	+15dB, −15dB, at 50Hz
TREBLE	+10dB, −10dB at 10,000Hz
FILTERS	
LOW	−3dB at 20Hz, 70Hz (10dB/oct.)
HIGH	−3dB at 6,000Hz, 12,000Hz (6dB/oct.)
LOUDNESS CONTROL (Continuous Loudness Volume at Minimum)	
	+10dB at 100Hz, +5dB at 10,000Hz
GENERAL	
Semiconductors	6 FETs; 55 Transistors; 26 Diodes; 5 Zener Diodes
Power Source	AC110, 117, 130, 220, 240V, 50/60Hz
Power Consumption	
Max.	420 watts
Rated	250 watts
Ac Outlets	
Switched	2 (total 200 watts)
Unswitched	2 (total 200 watts)
Dimensions	436mm (17¼") W x 144mm (5¾") H x 323mm (12¾") D
Weight	15.5kg (34.2 lbs)

Design and specifications subject to change without notice for improvements.

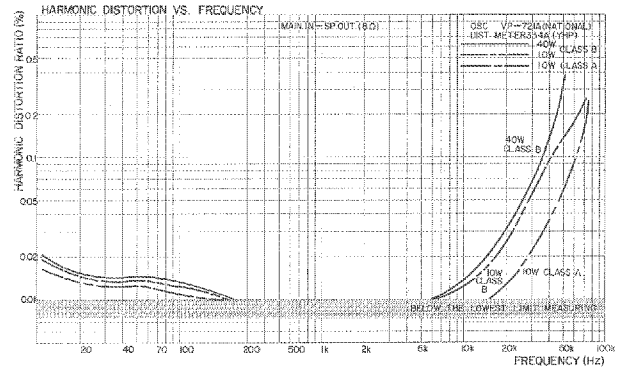
HARMONIC DISTORTION VS. POWER OUTPUT (OPERATION CLASS "B")



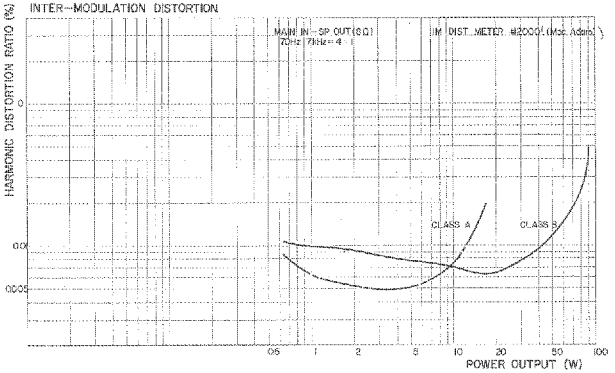
HARMONIC DISTORTION VS. POWER OUTPUT (OPERATION CLASS "A")



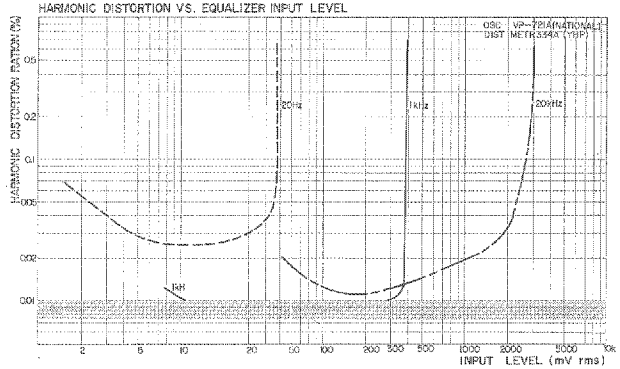
HARMONIC DISTORTION VS. FREQUENCY



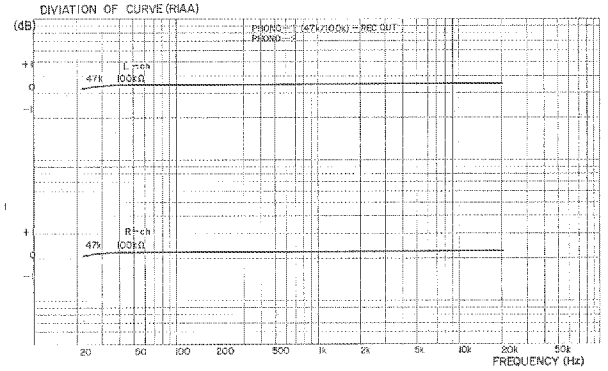
INTER-MODULATION DISTORTION



HARMONIC DISTORTION VS. EQUALIZER INPUT LEVEL



DEVIATION OF CURVE (RIAA)



SINCE 1887

YAMAHA

NIPPON GAKKI CO.,LTD. HAMAMATSU, JAPAN